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Abstract

SOME RESEARCHES ON THE ENVIRONMENTAL RADIOACTIVE CONTAMINATIONS IN ITALY

A.A. Cigna, M.M. Ferraris, F.G. Giorcelli and G.L. Papucci
Laboratorio per lo studio della Radioattività, C.N.E.N.,
Casaccia (Roma), Italia
L. Argiero, S. Manfredini and G. Palmas
Facoltà d'Ingegneria, Università di Pisa, Italia

The paper summarizes the work carried out by "Laboratorio per lo Studio della Radioattività Ambientale" under the CNEN-sponsored programme for environmental radioactivity survey. Some of the work concerning sea-water radioactive contamination was carried out by the Engineering Faculty of the Pisa University.

The activity and composition of fall-out collected at the Casaccia Centre for Nuclear Studies were determined during the period from 1961 through 1963. The following radionuclides were measured: Sr^{89}, Sr^{90}, Ce^{141}, $Ce^{144} + Pr^{144}$, Ru^{103}, $Ru^{106} + Rh^{106}$, Sb^{125}, Cs^{137}, $Zr^{95} + Nb^{95}$, Mn^{54}, $Ba^{140} + La^{140}$. The correlation between meteorological features and fall-out deposition was also studied and some detonations were dated.

The methods for chemical separations were chosen, taking into account both reliability and cost. For this reason some methods, previously adopted by other researchers, were considered and sometimes modified. Ion exchangers, both organic and inorganic, were preferred, whenever possible, because of their simple use and low cost. The procedures adopted here were proposed as a basis for a country-wide standardization of measurements of environmental radioactivity.

Some measurements of sea-water activity due to Sr^{89}, Sr^{90} and Cs^{137} were performed during the 1960-1963 period. The sampling points were selected along the Italian coasts and samples were collected at least once or twice a year. Seasonal influences on Sr^{90} contamination were investigated. Besides sea-water, some samples of fishes as well as of other sea-

organisms were collected and the contaminations of Sr^{89}, Sr^{90}, Zr^{95} + Ru^{106} + Rh^{106} were determined therein.

Apart from sea-organisms, the following items of the food chain were taken into consideration: soil, fresh water, hay, wheat, rice, vegetables, meat and milk. A search for Sr^{89}, Sr^{90}, Cs^{137} and I^{131} was conducted in the aforesaid materials. A correlation among the average values of radioactive contaminations in the different phases of the food chain was sought, in an attempt to report some observed ratios.